SEQUENCE LISTING

<110> Loomis, Carson R.
Oakley, Robert H.
Wang, Shuntai
Eckhardt, Allen E.

<120> Methods of Identifying Reduced Internalization Transmembrane Receptor Agonists

<130> 033072-092

<140> US 10/693,164
<141> 2003-10-24

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<151> 2002-10-25

<160> 41

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<220>
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<221> VARIANT
<222> 3, 4
<223> Xaa = Any Amino Acid

<400> 1
Asn Pro Xaa Xaa Tyr
1 5

<210> 2
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<212> PRT
<213> Artificial Sequence

<220>
<223> amino acid motif

<221> VARIANT
<222> 4
<223> Xaa = Any Amino Acid

<400> 2
Cys Ala Ala Xaa
1

<210> 3
<211> 43

<212> PRT
<213> Homo sapiens

<400> 3
Asn Pro Ile Val Tyr Ala Phe Arg Ile Gln Lys Phe Arg Val Thr Phe
 1   5   10   15
Leu Lys Ile Trp Asn Asp His Phe Arg Cys Gln Pro Ala Pro Pro Ile
            20   25   30
Asp Glu Asp Leu Pro Glu Glu Arg Pro Asp Asp
        35   40

<210> 4
<211> 176
<212> PRT
<213> Homo sapiens

<400> 4
Asn Pro Ile Ile Tyr Pro Cys Ser Ser Lys Glu Phe Arg Ala Phe Val
 1   5   10   15
Arg Ile Leu Gly Cys Gln Cys Arg Gly Arg Gly Arg Arg Arg Arg Arg
            20   25   30
Arg Arg Arg Arg Leu Gly Gly Cys Ala Tyr Thr Tyr Arg Pro Trp Thr
        35   40   45
Arg Gly Gly Ser Leu Glu Arg Ser Gln Ser Arg Lys Asp Ser Leu Asp
    50   55   60
Asp Ser Gly Ser Cys Leu Ser Gly Ser Gln Arg Thr Leu Pro Ser Ala
65   70   75   80
Ser Pro Ser Pro Gly Tyr Leu Gly Arg Gly Ala Pro Pro Pro Val Glu
                85   90   95
Leu Cys Ala Phe Pro Glu Trp Lys Ala Pro Gly Ala Leu Leu Ser Leu
            100   105   110
Pro Ala Pro Glu Pro Pro Gly Arg Arg Gly Arg His Asp Ser Gly Pro
        115   120   125
Leu Phe Thr Phe Lys Leu Leu Thr Glu Pro Glu Ser Pro Gly Thr Asp
    130   135   140
Gly Gly Ala Ser Asn Gly Gly Cys Glu Ala Ala Ala Asp Val Ala Asn
145   150   155   160
Gly Gln Pro Gly Phe Lys Ser Asn Met Pro Leu Ala Pro Gly Gln Phe
                165   170   175

<210> 5
<211> 29
<212> PRT
<213> Homo sapiens

<400> 5
Asn Pro Val Ile Tyr Thr Ile Phe Asn His Asp Phe Arg Arg Ala Phe
 1   5   10   15
Lys Lys Ile Leu Cys Arg Gly Asp Arg Lys Arg Ile Val
            20   25

<210> 6
<211> 29
<212> PRT
<213> Homo sapiens

<400> 6
Asn Pro Val Ile Tyr Thr Ile Phe Asn Gln Asp Phe Arg Arg Ala Phe
 1   5   10   15
Arg Arg Ile Leu Cys Arg Pro Trp Thr Gln Thr Ala Trp
            20   25

<210> 7
<211> 31
<212> PRT
<213> Homo sapiens

<400> 7
Asn Pro Val Ile Tyr Thr Val Phe Asn Gln Asp Phe Arg Pro Ser Phe
 1   5   10   15
Lys His Ile Leu Phe Arg Arg Arg Arg Arg Arg Gly Phe Arg Gln
            20   25   30

<210> 8
<211> 105
<212> PRT
<213> Homo sapiens

<400> 8
Asn Pro Ile Ile Tyr Cys Arg Ser Pro Asp Phe Arg Lys Ala Phe Gln
 1   5   10   15
Gly Leu Leu Cys Cys Ala Arg Arg Ala Ala Arg Arg Arg His Ala Thr
            20   25   30
His Gly Asp Arg Pro Arg Ala Ser Gly Cys Leu Ala Arg Pro Gly Pro
        35   40   45
Pro Pro Ser Pro Gly Ala Ala Ser Asp Asp Asp Asp Asp Asp Val Val
    50   55   60
Gly Ala Thr Pro Pro Ala Arg Leu Leu Glu Pro Trp Ala Gly Cys Asn
65   70   75   80
Gly Gly Ala Ala Ala Asp Ser Asp Ser Ser Leu Asp Glu Pro Cys Arg
                85   90   95
Pro Gly Phe Ala Ser Glu Ser Lys Val
            100   105

<210> 9
<211> 92
<212> PRT
<213> Homo sapiens

<400> 9
Asn Pro Leu Ile Tyr Cys Arg Ser Pro Asp Phe Arg Ile Ala Phe Gln
 1   5   10   15
Glu Leu Leu Cys Leu Arg Arg Ser Ser Leu Lys Ala Tyr Gly Asn Gly
            20   25   30
Tyr Ser Ser Asn Gly Asn Thr Gly Glu Gln Ser Gly Tyr His Val Glu
        35   40   45
Gln Glu Lys Glu Asn Lys Leu Leu Cys Glu Asp Leu Pro Gly Thr Glu
    50   55   60
Asp Phe Val Gly His Gln Gly Thr Val Pro Ser Asp Asn Ile Asp Ser
65   70   75   80
Gln Gly Arg Asn Cys Ser Thr Asn Asp Ser Leu Leu
                85   90

<210> 10
<211> 120
<212> PRT
<213> Homo sapiens

<400> 10
Asn Pro Ile Ile Tyr Ala Phe Asn Ala Asp Phe Arg Lys Ala Phe Ser
1 5 10 15
Thr Leu Leu Gly Cys Tyr Arg Leu Cys Pro Ala Thr Asn Asn Ala Ile
20 25 30
Glu Thr Val Ser Ile Asn Asn Asn Gly Ala Ala Met Phe Ser Ser His
35 40 45
His Glu Pro Arg Gly Ser Ile Ser Lys Glu Cys Asn Leu Val Tyr Leu
50 55 60
Ile Pro His Ala Val Gly Ser Ser Glu Asp Leu Lys Lys Glu Glu Ala
65 70 75 80
Ala Gly Ile Ala Arg Pro Leu Glu Lys Leu Ser Pro Ala Leu Ser Val
85 90 95
Ile Leu Asp Tyr Asp Thr Asp Val Ser Leu Glu Lys Ile Gln Pro Ile
100 105 110
Thr Gln Asn Gly Gln His Pro Thr
115 120

<210> 11
<211> 22
<212> PRT
<213> Homo sapiens

<400> 11
Asn Pro Ile Ile Tyr Thr Thr Phe Asn Ile Glu Phe Arg Lys Ala Phe
1 5 10 15
Leu Lys Ile Leu His Cys
20

<210> 12
<211> 22
<212> PRT
<213> Homo sapiens

<400> 12
Asn Pro Val Ile Tyr Thr Thr Phe Asn Ile Glu Phe Arg Lys Ala Phe
1 5 10 15
Leu Lys Ile Leu Ser Cys
20

<210> 13
<211> 24
<212> PRT
<213> Homo sapiens

<400> 13
Asn Pro Val Ile Tyr Thr Val Phe Asn Ala Glu Phe Arg Asn Val Phe
1 5 10 15
Arg Lys Ala Leu Arg Ala Cys Cys
20

<210> 14
<211> 123
<212> PRT
<213> Homo sapiens

<400> 14
Asn Pro Val Ile Tyr Ala Phe Asn Ala Asp Phe Gln Lys Val Phe Ala
 1   5   10   15
Gln Leu Leu Gly Cys Ser His Phe Cys Ser Arg Thr Pro Val Glu Thr
            20   25   30
Val Asn Ile Ser Asn Glu Leu Ile Ser Tyr Asn Gln Asp Ile Val Phe
        35   40   45
His Lys Glu Ile Ala Ala Ala Tyr Ile His Met Met Pro Asn Ala Val
    50   55   60
Thr Pro Gly Asn Arg Glu Val Asp Asn Asp Glu Glu Glu Gly Pro Phe
65   70   75   80
Asp Arg Met Phe Gln Ile Tyr Gln Thr Ser Pro Asp Gly Asp Pro Val
                85   90   95
Ala Glu Ser Val Trp Glu Leu Asp Cys Glu Gly Glu Ile Ser Leu Asp
            100   105   110
Lys Ile Thr Pro Phe Thr Pro Asn Gly Phe His
        115   120

<210> 15
<211> 47
<212> PRT
<213> Homo sapiens

<400> 15
Asn Pro Met Cys Tyr Ala Leu Cys Asn Lys Ala Phe Arg Asp Thr Phe
 1   5   10   15
Arg Leu Leu Leu Leu Cys Arg Trp Asp Lys Arg Arg Trp Arg Lys Ile
            20   25   30
Pro Lys Arg Pro Gly Ser Val His Arg Thr Pro Ser Arg Gln Cys
        35   40   45

<210> 16
<211> 31
<212> PRT
<213> Homo sapiens

<400> 16
Asn Pro Ala Cys Tyr Ala Leu Cys Asn Ala Thr Phe Lys Lys Thr Phe
 1   5   10   15
Lys His Leu Leu Met Cys His Tyr Lys Asn Ile Gly Ala Thr Arg
            20   25   30

<210> 17
<211> 51
<212> PRT
<213> Homo sapiens

<400> 17
Asn Pro Val Cys Tyr Ala Leu Cys Asn Lys Thr Phe Arg Thr Thr Phe
 1   5   10   15

Lys Met Leu Leu Leu Cys Gln Cys Asp Lys Lys Lys Arg Arg Lys Gln
20 25 30
Gln Tyr Gln Gln Arg Gln Ser Val Ile Phe His Lys Arg Ala Pro Glu
35 40 45
Gln Ala Leu
50

<210> 18
<211> 31
<212> PRT
<213> Homo sapiens

<400> 18
Asn Pro Ala Cys Tyr Ala Leu Cys Asn Ala Thr Phe Lys Lys Thr Phe
1 5 10 15
Arg His Leu Leu Leu Cys Gln Tyr Arg Asn Ile Gly Thr Ala Arg
20 25 30

<210> 19
<211> 42
<212> PRT
<213> Homo sapiens

<400> 19
Asn Pro Ile Cys Tyr Ala Leu Cys Asn Arg Thr Phe Arg Lys Thr Phe
1 5 10 15
Lys Met Leu Leu Leu Cys Arg Trp Lys Lys Lys Lys Val Glu Glu Lys
20 25 30
Leu Tyr Trp Gln Gly Asn Ser Lys Leu Pro
35 40

<210> 20
<211> 24
<212> PRT
<213> Homo sapiens

<400> 20
Asn Pro Val Ile Tyr Ala Tyr Phe Asn Lys Asp Phe Gln Asn Ala Phe
1 5 10 15
Lys Lys Ile Ile Lys Cys Lys Phe
20

<210> 21
<211> 26
<212> PRT
<213> Homo sapiens

<400> 21
Asn Pro Ile Ile Tyr Thr Met Ser Asn Glu Asp Phe Lys Gln Ala Phe
1 5 10 15
His Lys Leu Ile Arg Phe Lys Cys Thr Ser
20 25

<210> 22

<211> 24
<212> PRT
<213> Homo sapiens

<400> 22
Asn Pro Leu Leu Tyr Thr Ser Phe Asn Glu Asp Phe Lys Leu Ala Phe
 1   5   10   15
Lys Lys Leu Ile Arg Cys Arg Glu
            20

<210> 23
<211> 37
<212> PRT
<213> Homo sapiens

<400> 23
Asn Pro Ile Ile Tyr Cys Leu Arg Asn Gln Glu Val Lys Arg Ala Leu
 1   5   10   15
Cys Cys Ile Leu His Leu Tyr Gln His Gln Asp Pro Asp Pro Lys Lys
            20   25   30
Gly Ser Arg Asn Val
        35

<210> 24
<211> 27
<212> PRT
<213> Homo sapiens

<400> 24
Asn Pro Leu Ile Tyr Thr Leu Arg Asn Met Glu Val Lys Gly Ala Leu
 1   5   10   15
Arg Arg Leu Leu Gly Lys Gly Arg Glu Val Gly
            20   25

<210> 25
<211> 62
<212> PRT
<213> Homo sapiens

<400> 25
Asn Pro Leu Phe Tyr Gly Phe Leu Gly Lys Lys Phe Lys Arg Tyr Phe
 1   5   10   15
Leu Gln Leu Leu Lys Tyr Ile Pro Pro Lys Ala Lys Ser His Ser Asn
            20   25   30
Leu Ser Thr Lys Met Ser Thr Leu Ser Tyr Arg Pro Ser Asp Asn Val
        35   40   45
Ser Ser Ser Thr Lys Lys Pro Ala Pro Cys Phe Glu Val Glu
    50   55   60

<210> 26
<211> 50
<212> PRT
<213> Homo sapiens

<400> 26

```
Asn Pro Phe Leu Tyr Cys Phe Val Gly Asn Arg Phe Gln Gln Lys Leu
 1               5                  10                  15
Arg Ser Val Phe Arg Val Pro Ile Thr Trp Leu Gln Gly Lys Arg Glu
            20                  25                  30
Ser Met Ser Cys Arg Lys Ser Ser Ser Leu Arg Glu Met Glu Thr Phe
        35                  40                  45
Val Ser
    50
```

<210> 27
<211> 51
<212> PRT
<213> Homo sapiens

<400> 27

```
Asn Pro Leu Ile Tyr Ala Phe Ile Gly Gln Lys Phe Arg His Gly Leu
 1               5                  10                  15
Leu Lys Ile Leu Ala Ile His Gly Leu Ile Ser Lys Asp Ser Leu Pro
            20                  25                  30
Lys Asp Ser Arg Pro Ser Phe Val Gly Ser Ser Ser Gly His Thr Ser
        35                  40                  45
Thr Thr Leu
    50
```

<210> 28
<211> 67
<212> PRT
<213> Homo sapiens

<400> 28

```
Asn Pro Leu Ile Tyr Ala Phe Ala Gly Glu Lys Phe Arg Arg Tyr Leu
 1               5                  10                  15
Tyr His Leu Tyr Gly Lys Cys Leu Ala Val Leu Cys Gly Arg Ser Val
            20                  25                  30
His Val Asp Phe Ser Ser Ser Glu Ser Gln Arg Ser Arg His Gly Ser
        35                  40                  45
Val Leu Ser Ser Asn Phe Thr Tyr His Thr Ser Asp Gly Asp Ala Leu
    50                  55                  60
Leu Leu Leu
65
```

<210> 29
<211> 59
<212> PRT
<213> Homo sapiens

<400> 29

```
Asn Pro Ile Leu Tyr Asn Leu Val Ser Ala Asn Phe Arg His Ile Phe
 1               5                  10                  15
Leu Ala Thr Leu Ala Cys Leu Cys Pro Val Trp Arg Arg Arg Arg Lys
            20                  25                  30
Arg Pro Ala Phe Ser Arg Lys Ala Asp Ser Val Ser Ser Asn His Thr
        35                  40                  45
Leu Ser Ser Asn Ala Thr Arg Glu Thr Leu Tyr
    50                  55
```

<210> 30
<211> 107
<212> PRT
<213> Homo sapiens

<400> 30
Asn Pro Ile Ile Tyr Cys Cys Leu Asn Asp Arg Phe Arg Leu Gly Phe
 1   5   10   15
Lys His Ala Phe Arg Cys Cys Pro Phe Ile Ser Ala Gly Asp Tyr Glu
            20   25   30
Gly Leu Glu Met Lys Ser Thr Arg Tyr Leu Gln Thr Gln Gly Ser Val
        35   40   45
Tyr Lys Val Ser Arg Leu Glu Thr Thr Ile Ser Thr Val Val Gly Ala
    50   55   60
His Glu Glu Glu Pro Glu Asp Gly Pro Lys Ala Thr Pro Ser Ser Leu
65   70   75   80
Asp Leu Thr Ser Asn Cys Ser Ser Arg Ser Asp Ser Lys Thr Met Thr
                85   90   95
Glu Ser Phe Ser Phe Ser Ser Asn Val Leu Ser
            100   105

<210> 31
<211> 50
<212> PRT
<213> Homo sapiens

<400> 31
Asn Pro Trp Ile Tyr Ala Ser Phe Ser Ser Val Ser Ser Glu Leu Arg
 1   5   10   15
Ser Leu Leu Cys Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly Pro
            20   25   30
Gln Asp Glu Ser Cys Thr Thr Ala Ser Ser Ser Leu Ala Lys Asp Thr
        35   40   45
Ser Ser
    50

<210> 32
<211> 83
<212> PRT
<213> Homo sapiens

<400> 32
Asn Pro Val Ile Tyr Asn Leu Met Ser Gln Lys Phe Arg Ala Ala Phe
 1   5   10   15
Arg Lys Leu Cys Asn Cys Lys Gln Lys Pro Thr Glu Lys Pro Ala Asn
            20   25   30
Tyr Ser Val Ala Leu Asn Tyr Ser Val Ile Lys Glu Ser Asp His Phe
        35   40   45
Ser Thr Glu Leu Asp Asp Ile Thr Val Thr Asp Thr Tyr Leu Ser Ala
    50   55   60
Thr Lys Val Ser Phe Asp Asp Thr Cys Leu Ala Ser Glu Val Ser Phe
65   70   75   80
Ser Gln Ser

<210> 33

<211> 65
<212> PRT
<213> Homo sapiens

<400> 33
Asn Pro Trp Ile Tyr Met Leu Phe Thr Gly His Leu Phe His Glu Leu
 1   5   10   15
Val Gln Arg Phe Leu Cys Cys Ser Ala Ser Tyr Leu Lys Gly Arg Arg
            20   25   30
Leu Gly Glu Thr Ser Ala Ser Lys Lys Ser Asn Ser Ser Ser Phe Val
        35   40   45
Leu Ser His Arg Ser Ser Ser Gln Arg Ser Cys Ser Gln Pro Ser Thr
    50   55   60
Ala
65

<210> 34
<211> 75
<212> PRT
<213> Homo sapiens

<400> 34
Asn Pro Val Leu Tyr Ser Leu Met Ser Ser Arg Phe Arg Glu Thr Phe
 1   5   10   15
Gln Glu Ala Leu Cys Leu Gly Ala Cys Cys His Arg Leu Arg Pro Arg
            20   25   30
His Ser Ser His Ser Leu Ser Arg Met Thr Thr Gly Ser Thr Leu Cys
        35   40   45
Asp Val Gly Ser Leu Gly Ser Trp Val His Pro Leu Ala Gly Asn Asp
    50   55   60
Gly Pro Glu Ala Gln Gln Glu Thr Asp Pro Ser
65   70   75

<210> 35
<211> 62
<212> PRT
<213> Homo sapiens

<400> 35
Asn Pro Leu Val Tyr Cys Phe Met His Arg Arg Phe Arg Gln Ala Cys
 1   5   10   15
Leu Glu Thr Cys Ala Arg Cys Cys Pro Arg Pro Pro Arg Ala Arg Pro
            20   25   30
Arg Ala Leu Pro Asp Glu Asp Pro Pro Thr Pro Ser Ile Ala Ser Leu
        35   40   45
Ser Arg Leu Ser Tyr Thr Thr Ile Ser Thr Leu Gly Pro Gly
    50   55   60

<210> 36
<211> 82
<212> PRT
<213> Homo sapiens

<400> 36
Asn Pro Leu Val Tyr Ala Leu Ala Ser Arg His Phe Arg Ala Arg Phe
 1   5   10   15

```
Arg Arg Leu Trp Pro Cys Gly Arg Arg Arg Arg His Arg Ala Arg Arg
            20                  25                  30
Ala Leu Arg Arg Val Arg Pro Ala Ser Ser Gly Pro Pro Gly Cys Pro
        35                  40                  45
Gly Asp Ala Arg Pro Ser Gly Arg Leu Leu Ala Gly Gly Gly Gln Gly
    50                  55                  60
Pro Glu Pro Arg Glu Gly Pro Val His Gly Gly Glu Ala Ala Arg Gly
65                  70                  75                  80
Pro Glu
```

<210> 37
<211> 76
<212> PRT
<213> Homo sapiens

<400> 37

```
Asn Pro Ile Ile Tyr Thr Leu Thr Asn Lys Glu Met Arg Arg Ala Phe
 1               5                  10                  15
Ile Arg Ile Met Ser Cys Cys Lys Cys Pro Ser Gly Asp Ser Ala Gly
            20                  25                  30
Lys Phe Lys Arg Pro Ile Ile Ala Gly Met Glu Phe Ser Arg Ser Lys
        35                  40                  45
Ser Asp Asn Ser Ser His Pro Gln Lys Asp Glu Gly Asp Asn Pro Glu
    50                  55                  60
Thr Ile Met Ser Ser Gly Asn Val Asn Ser Ser Ser
65                  70                  75
```

<210> 38
<211> 80
<212> PRT
<213> Homo sapiens

<400> 38

```
Asn Pro Ile Ile Tyr Ala Leu Arg Ser Lys Asp Leu Arg His Ala Phe
 1               5                  10                  15
Arg Ser Met Phe Pro Ser Cys Glu Gly Thr Ala Gln Pro Leu Asp Asn
            20                  25                  30
Ser Met Gly Asp Ser Asp Cys Leu His Lys His Ala Asn Asn Ala Ala
        35                  40                  45
Ser Val His Arg Ala Ala Glu Ser Cys Ile Lys Ser Thr Val Lys Ile
    50                  55                  60
Ala Lys Val Thr Met Ser Val Ser Thr Asp Thr Ser Ala Glu Ala Leu
65                  70                  75                  80
```

<210> 39
<211> 59
<212> PRT
<213> Homo sapiens

<400> 39

```
Asn Pro Val Leu Tyr Ala Phe Leu Asp Glu Asn Phe Lys Arg Cys Phe
 1               5                  10                  15
Arg Gln Leu Cys Arg Lys Pro Cys Gly Arg Pro Asp Pro Ser Ser Phe
            20                  25                  30
Ser Arg Pro Arg Glu Ala Thr Ala Arg Glu Arg Val Thr Ala Cys Thr
```

```
        35                  40                  45
Pro Ser Asp Gly Pro Gly Gly Gly Arg Ala Ala
    50                  55
```

<210> 40
<211> 58
<212> PRT
<213> Homo sapiens

<400> 40

```
Asp Pro Phe Val Tyr Tyr Phe Val Ser His Asp Phe Arg Asp His Ala
 1               5                  10                  15
Lys Asn Ala Leu Leu Cys Arg Ser Val Arg Thr Val Lys Gln Met Gln
            20                  25                  30
Val Ser Leu Thr Ser Lys Lys His Ser Arg Lys Ser Ser Ser Tyr Ser
        35                  40                  45
Ser Ser Ser Thr Thr Val Lys Thr Ser Tyr
    50                  55
```

<210> 41
<211> 66
<212> PRT
<213> Homo sapiens

<400> 41

```
Asn Gly Glu Val Gln Ala Glu Leu Arg Arg Lys Trp Arg Arg Trp His
 1               5                  10                  15
Leu Gln Gly Val Leu Gly Trp Ser Ser Lys Ser Gln His Pro Trp Gly
            20                  25                  30
Gly Ser Asn Gly Ala Thr Cys Ser Thr Gln Val Ser Met Leu Thr Arg
        35                  40                  45
Val Ser Pro Ser Ala Arg Arg Ser Ser Ser Phe Gln Ala Glu Val Ser
    50                  55                  60
Leu Val
65
```